DOCUMENT RESUME

ED 370 188 EA 025 818

AUTHOR Brooks, Annie
TITLE Power and the Production of Knowledge: Collective Team Learning in Work Organizations.
PUB DATE Apr 94
NOTE 14p.; Paper presented at the Annual Meeting of the American Educational Research Association (New Orleans, LA, April 4-8, 1994).
PUB TYPE Speeches/Conference Papers (150) -- Reports - Evaluative/Feasibility (142)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS *Cooperative Learning; Interprofessional Relationship; Learning Processes; *Organizational Climate; Organizational Effectiveness; *Power Structure; *Productivity; *Teamwork; Work Environment

ABSTRACT

This paper presents findings of a study that examined the relationship between the outcome of collective team learning and the extent of differences in power that team members have available to them. This successful outcome is defined as the production of new knowledge. The study examined four teams in the research and development department of a large, high-technology manufacturing company, whose jobs were to improve the production process. Using an interpretive interactionist approach, data were derived from interviews with 11 team members and other organizational members, and from observations of team meetings. Findings identify two domains in which new knowledge is produced--the technical and the social. Four grounded propositions are developed to explain how the collective team learning process and organizational authority structures interact. These propositions suggest that differences in the availability of power to individual employees constrain the productivity of knowledge. From this perspective, work organizations are seriously disadvantaged by relying predominantly on the limited knowledge of high-ranking individuals. Finally, cultural and historical ideals that present additional obstacles to developing work teams in organizations are described. One figure is included. (LMI)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

U S DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)
This document has been reproduced as received from the person or organization originating it.
Minor changes have been made to improve reproduction quality.
Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

ED 370 188

Power And The Production Of Knowledge: Collective Team Learning In Work Organizations

by Annie Brooks
University of Texas at Austin

As work and work organizations become more complex, the consequences of individual decisions and actions become less clear. As they are joined with the decisions and actions of others to extend across the organization and into the future, individual experience becomes a less reliable basis for learning. Therefore, increasingly such learning tasks as developing new products, improving work processes, planning organizational strategy, and developing or improving services are being taken on by teams (Grey, 1989; Parker, 1990; Brooks, 1992).

Although an extensive body of research exists on teams, particularly in the areas of work group effectiveness and group dynamics, as well as on adult learning, only a few studies have specifically addressed learning as a collective team activity. The contribution of this study to our understanding of team learning is to posit an explicit link between the extent of the differences in power team members have available to them and the successful outcome of collective team learning. This outcome is defined as the production of new knowledge. Specifically, based on research conducted with teams over a one year period, I identify two domains in which new knowledge is produced: the technical and the social. I also suggest four grounded propositions to explain how the collective team learning process and the organizational authority structures interact.

RESEARCH METHODS

This study is situated within the critical paradigm. It follows an emergent design and relies on qualitative case study data. In the following sections, I will tell the story of how I carried out this research.

Definitions

This study draws on the reflective learning literature to define learning as the transformation of experience into knowledge (Kolb, 1986). It draws on the work of Schutz (1964) and Berger and Luckman (1967) to understand knowledge as socially distributed and socially constructed . Although learning is often taken to mean either the acquisition of expert knowledge or socialization, for the purpose of this study, learning is defined as the construction of new knowledge. Thus, collective team learning is defined as the construction of collective new knowledge by a team. Similarly, new knowledge is taken to be the output of learning.

Theoretical Perspective

I began the exploratory phase of this project influenced by the idea that knowledge is socially distributed and socially constructed (Schutz, 1964; Berger and Luckman, 1967). However, early in the study, I began to notice that the notion of "contribution to the team and the company" was brought up repeatedly by study participants. Because the job of the teams was to produce knowledge, to team members a contribution seemed to mean a contribution of knowledge. As the study progressed, it became increasingly clear that for many of the team members the ability to contribute was related to the power they could claim relative to others. Following this line of thought, and as I continued my study, I began to seek theorists who had written about the relationship between power and knowledge. Post-structuralists, race-based theorists, and feminists such as Foucault (1980), hooks (1989), Lather (1991)and Lazega (1992) seemed to have developed an understanding of this relationship that contributed to what I was beginning to see occurring in the knowledge production process of the teams I was studying. For example, Foucault writes explicitly, "Knowledge derives not from some subject of knowledge but from the power relations that invest it....All knowledge is political" (1980, p.220). In other words, to contribute knowledge means to participate in defining how a social group or culture will understand reality. These writers view power as being embedded in existing social structures and discourse, rather than as being the possession of individuals or groups, who then use it to dominate and control others in the way conceptualized by such writers as Max Weber or Karl Marx. Foucault argues that power is "never localised here or there, never in anybody's hands, never appropriated as a commodity or a piece of wealth. Power is employed and exercised through a net-like organisation. And not only do individuals circulate between its threads; they are always in the position of undergoing and exercising this power" (Foucault, 1986, p.234).

Research Questions

The research began with the general question of why some teams learn and some teams do not. An exploratory study suggested that the team learning process included specific tasks, and that power differences among individual team members affected their ability to contribute to carrying out these tasks. Based on these insights, the remainder of the study addressed the following three questions:

a) What was the team learning process?

b) how did the differential availability of power to individual team members affect the collective team learning outcome?

c) how did organizational structures and policies affect the team learning process?

Context And Study Participants

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY
A. K. Brooks
TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

EA 025 818

BEST COPY AVAILABLE

The study took place in a research and development department of a large, high-technology manufacturing company. The research and development department was responsible for designing the manufacturing processes of new products. Four teams, whose general task was to improve the production process, were recruited for the study by the unit's teams coordinator. Three of the four teams considered themselves successful, and one did not. The teams indicated their opinion of their own success by their decision about whether to compete on the basis of their accomplishments in an international company-wide competition for teams. The teams' goal was to contribute to the reduction in the time it takes to move a product from design to market. Employees became members of teams by volunteering, and membership ranged from between ten and fifteen people, with the exact number and the composition changing over time. Teams selected their own leaders. Each team was assigned a "godfather," or person with managerial authority, to support and help secure resources. None of the teams, as a whole, had been formally trained in group process or inquiry skills, although some individual members had been trained in the past on other teams. For the most part, teams structured their own learning, with only occasional reference to guidelines that had been remembered by individual members about how to work together as a team.

Research Design

Because of the extensive research literature currently existing on groups, I paid special attention to scholarly critique of this extant literature. Several suggestions for future research on groups emerged from these critiques: (a) It needs to be carried out with groups in their natural context, rather than with artificially constructed groups in laboratories (Hackman, 1987; Schwartzman, 1986; Goodman, Ravlin, & Schminke 1990); (b) it needs to distinguish between groups doing different kinds of tasks (McGrath, 1984); (c) it should link group process to outcome, rather than simply describing the process (Hackman, 1987); and (d) it should attempt to identify critical "levers" that can influence group performance (Goodman, 1986).

This study addresses these research design concerns in several ways: (a) It was carried out on teams in the research and development unit of a large high technology manufacturing firm in an organizational, rather than a laboratory setting; (b) it explicitly examines the interaction between teams and their organizational context; (c) it looks only at teams with the task of constructing new knowledge; (d) it considers new knowledge to be the teams' output; (e) it uses organizational and team assessments of this output to determine whether or not a team was successful; (f) it identifies the differences in power available to individual team members as a "critical lever" in the successful production of knowledge in the social domain; and (g) it identifies low availability of power as a barrier to carrying out the tasks that are part of the active work of collective team learning.

Procedures

The specific research methodology and procedures were influenced by Denzin's (1989) interpretive interactionist approach to data collection and analysis, in which the attempt is made to understand "how this historical moment universalizes itself in the lives of interacting individuals" (p.139). According to Denzin, what we often take to be individual and personal troubles are in fact rooted in structural problems at the societal level. Thus, my interviews and observations focused on identifying difficulties these teams encountered in producing new knowledge collectively, and finding out how these difficulties might be related to organizational structures and policies. If a difficulty was pervasive across individuals and teams, I inferred that it reflected an organizational or social pattern. If a difficulty was idiosyncratic, I reserved judgment since the difficulty might be specific to an individual or team.

The research included the following tasks: (a) Identifying the research questions; (b) critically reviewing the adult learning and group effectiveness literature; (c) collecting data, especially personal narrative pertaining to the team learning experience, but also observation of team meetings and records and documents relevant to the teams; (d) describing each team, and closely examining the data, in order to identify recurring features and key elements for each team; (e) determining how each individual and team are alike yet unlike each other; (f) coding the data and identifying key themes; (g) assembling and comparing data, in order to gain insight into the theme's meaning in relation to the research questions; (h) reassembling the team learning experience, in order to understand again empathetically and in context, rather than analytically and decontextualized; (i) locating the team learning experience within the historical moment and the social structures of the work organization and the nation; and (j) constructing the narrative. Although these tasks are listed sequentially, they in fact occurred recurrently, and even at times simultaneously.

Intensive data collection took place over a four month period, although intermittent contact occurred over a longer period, as a result of the continued presence on-site of a doctoral student research assistant, who although not a team member, was also employed by the company in the research and development unit. Team members who participated in formal interviews were selected to achieve a broad variation in hierarchical rank, gender, age, and ethnic and racial background. Eleven team members were interviewed formally, with additional informal discussions occurring over the four month period with various team and organizational members. In addition, there were eight formal observations of team meetings. I undertook repeated rounds of data collection and analysis, in order to refine my understanding of what was taking place on the teams. The recurrent interviews, observations, and

the participation of the on-site research assistant ensured an ongoing exchange of information and opportunities for the validation of data.

To help assure trustworthiness, the data for this study came from multiple sources (Lincoln & Guba 1985). Field notes were kept to record all encounters with members of the organizations. Field journals were maintained to record methodological decisions, reflections on personal interaction with the research process, and emerging hypotheses about the meaning of the data (Goetz & LeCompte, 1984). Data were sorted, coded, and interpreted in an ongoing process that continued throughout the study. Additional measures employed to strengthen trustworthiness were triangulation of investigators, data sources, and data collection techniques; negative case analysis; and critical reflection on the research process.

THE STORIES OF THE FOUR TEAMS

In this study, each team was considered as a separate case, although they all share the same organizational setting. What follows is the story of each of the teams at the time I studied them.

The Empowered Team

The Empowered Team, a team of about twelve members, was area specific, and included approximately equal numbers of engineers, operators, technicians, and clerks, and an auditor. It included eight men and four women. Of those, five were Hispanic, three were black, one was Asian, and the rest were white. The chair, Hal, was an engineer in the area, and was guided by a clear vision of worker empowerment. He described himself as giving the workers encouragement and helping them value themselves. "I want them to see that their position can make a difference --- that what they do is important. Leading this team is all contact and relationship building. If I care and they can tell I care, they do better." For Hal, the way in which he led this team was an expression of a personal mission and set of facilitation skills he had developed through his volunteer work with church youth groups. In fact, if he didn't have to work, Hal would have been happy to volunteer full-time with these youth groups.

Participants on this team spoke warmly of their leader and the way in which he expressed the value he placed on them and their contribution. One operator noted, "Everyone has something to do and contributes." A technician described his experience: "I do a lot of computer analytical work for the team. Hal imposed that on me - not in a bad way - I love it. I had thought I should drop out. I didn't feel I was a contributor. But Hal said, 'No. I won't let you.' He made me feel I was needed. He might not go that far with operators."

Hal encouraged members' contributions by the way in which he facilitated the meetings. The following interchange illustrates such concrete facilitator skills as restatement, open-ended requests for help, inclusion of all team members with the pronoun "we", enthusiasm, and reference to the importance of skills and knowledge of people who are not present, but would be able to make a contribution. Team members responded by offering their own knowledge and ideas.

Hal: "What else can we do?"
Dave (technician): (makes a suggestion).
Hal: (restates Dave's suggestion for clarification)
Dave: (explains what he meant)
Brigit (operator): (adds more information)
Hal: "Maybe we could get Bruce (not a team member) to really *see* what is happening. If we could get Bruce that would really be great!
Jamilla (operator): How about I bring in another overhead next week to show data?

Both team and individual learning were fostered on this team. Team learning was facilitated on this team in several ways. First, an atmosphere of collaboration was fostered, in which, "everyone is friends here. They help each other." Secondly, the team leader was concerned that each member be enabled to participate. One operator described, "When I came back from maternity leave, Hal made a big issue out of explaining to me what's going on at the meeting. He came by when I was working and gave me a book about what we were working on on the team. He even got me into a class about it." According to a technician, "Since our team has both engineers and operators, things are done so everyone can understand. Participants are all collecting data. Everyone participates directly in the team. Operators have specific knowledge about parts of our area. We want everyone involved and able to contribute." He went on to give specific examples of the knowledge each team member brought. Thirdly, the team works on tasks they find interesting, difficult, and relevant. A team member explained, "People didn't contribute on the other team I was on, because they were not interested in the task. It was too cut and dried and operators had a hard time understanding all of the technical stuff. We dealt with things that weren't important. Now we look at the process and decide what needs help the most, and choose that. The task is actually *in* process. We also work on harder issues than the other team did. We set our standards higher than the other team did. We work harder. If the task is too easy, I lose interest."

The team also provided opportunities to learn for many individual team members. On the Empowered Team, one member talked about getting insight about her job from the team. "I learn about 'specs' and maintenance. I learned to work on a computer and how to present graphs in different ways." Hal structured this individual team member learning in several ways: (a) By his skilled facilitation of team meetings; (b) by working closely with individual team members to see that they were able to collect data, come to team meetings, and understand what was going on; (c) by monitoring and intervening, when individuals seemed to be losing their connection to the team; and (d) by bringing in information from beyond the boundaries of the members' jobs and the team. In many ways, Hal played the role of a teacher. However, his handling of this role appeared to have both a liberating and a constraining dimension. In my field notes, I jotted down that "Hal seems like a teacher. He seems to already know the answers he wants from the team members to a lot of the questions he's asking."

The "A" Team

The "A" Team had a reputation as "a winner" and the operator and technician interviewed both attributed this to the large number of engineers. The engineer interviewed attributed the team's success to a new interpersonally-oriented management style, that had been brought into their area and shared with the engineers. He believed that what the engineers learned about this new management style would trickle down to the technicians and operators.

The was an all male team and was made up of five engineers and six operators or technicians. It included one Hispanic, one Asian, and the rest European-Americans Team meetings were heavily dominated by engineers, with input from operators and technicians on non-technical issues only, such as costuming for their presentation at the company's international teams' competition. A technician described his team in this way: "This team is engineering heavy. It's experienced a lot of success because of the engineers, but there's not enough operator input. The operators need to get organized, so they can get their input heard. Maybe have a pre-meeting of five minutes, in order to get organized. Actually, operators should chair these meetings, because it is the only time for them to get their problems addressed. I've seen engineer leaders brush operators' problems aside."

The "A" Team's leader, Barry, functioned very differently than Hal. According to one technician, "He doesn't educate operators because it distracts from the conversation." An engineer described his experience on the team: "We have several enthusiastic members who each assume leadership roles at different times. We have temporary leaders who lead around specific tasks. We have good chemistry on this team. There are no rivals among members." This engineer went on to describe the positive qualities he saw in Barry's leadership: not heavy-handed, patient, easy-going, allows leadership to change hands, and tolerant. As an example of this final attribute, he cited incidents in which operators talked at length about what engineers considered to be a small matter, "but Barry listened anyway."

Motivation to participate in teamwork seemed to vary among members. For example, the engineer interviewed said he joined the team, because it had a reputation as enthusiastic, and it had a large impact. In addition, he anticipated a career advantage from the visibility gained from being on the team and from interacting with people other than engineers. The technician interviewed explained his reasons as, "It's exciting to be on a winning team. The winning feeling is unaffected by whether operators contribute or not. Just winning makes it good to be on the team." Finally, the operator interviewed cited the opportunity to learn and develop and to help the company "do something better." He said he had no expectation of career advancement, as a result of team participation.

The Lost Team

The Lost Team was the only team I studied that did not consider its accomplishments significant enough for it to enter the international teams competition. The team included five engineers and five technicians, as well as four women and six men, and one Hispanic and one black. The team was dominated by its engineer leader, Dave, and another engineer with whom he frequently dialogued at length during team meetings. Field notes document multiple instances, in which the leader argued down or belittled contributions by various team members, and dominated the meeting time as he dialogue with another engineer. A typical interchange on this team was as follows:

Dave: What other ideas are there? John. Are you awake?
John (an engineer): (with embarrassment) Yeah. I'm awake.
Dave: Carlos. Do you have any ideas?
Carlos (a technician): (After a long pause Carlos asks a technical question which the chair answers).
Dave: Do you have any ideas, Bettina, of what we can do?
Bettina (technician): (Silence).
Dave: Shall we... (Makes a suggestions which is met by silence). Maria (a technician) is the only one shaking her head.
Martha (an engineer) offers some information which the chair argues down.

This team was not consistent on setting action items from week to week. Often the only item addressed was who was going to bring the donuts. When data collection tasks were assigned, they were frequently not followed up on at the next meeting, because the responsible person was not present, or had not collected the data. Learning on this team appeared to be perceived as the dissemination of expert knowledge by the engineers to other team members. This attitude was symbolized by a "Far Side" cartoon printed on each week's minutes, in which a student in a classroom raises his hand and asks to be excused because his head is full.

There was no consistent perception about the source of the team's difficulties. One engineer on the team believed it was lack of operator input, and another that there was a conflict over whether the operators' primary task was to raise production rates, or help conduct research to improve the production process. Another engineer suggested that operators perceived themselves as being exploited in the meetings by the engineers for their own benefit. Dave believed the problem was that the departmental area that the team focused on had no problems that weren't shared by the rest of the department, so they lacked the control to implement solutions. Two former team members attributed the team's problems to a lack of enthusiasm on the part of the leader, and a disregard for operators.

The People's Team

The People's Team was unique among the teams that participated in this study. Its uniqueness originated in the fact that its membership consisted entirely of operators and technicians, rather than including engineers, and that it represented multiple areas in the department, rather than a single area. It included eight men and four women, and one black, one east Indian, one east Asian, one Hispanic, and the rest white. The team leader, Chris, was elected by his team mates. A technician studying at the local university to be an engineer, Chris was described by other team members as aggressive, tactless, and at times not well-liked. But in the words of one operator, "He is very gung ho. He expects a lot out of people and he gets the job done." From Chris' perspective, "People want to do a good job, so I give them a plan." Team members perceived their team as very successful, and pointed to several innovations they had made that had won them recognition in the company.

Chris believed that management did not put aggressive enough expectations on and underestimated the capabilities of the teams. Like Chris, other operators and technicians also thought that management underestimated their abilities, which caused them to become bored with and cynical about their job. However, for many, belonging to a team afforded the opportunity to extend their understanding and experience beyond the confines of their particular job. One team member described how being on the team had given her a better overview of the whole operation. "Before, if I had an inspector coming - look out! Now I'm wondering what's coming in from other areas. Now I know what the inspection is for. I'm more involved in the process." She gave the specific example of how her work group worked with a slump after lunch, never thinking that it might affect the work of some other group. By being on the team, she began to see that other groups needed her group to work more evenly throughout the shift, so that work didn't pile up on the last hour of the shift.

Members of the Peoples Team viewed the purpose of the teams very differently from the engineers and managers I interviewed on other teams. Whereas the engineers and managers frequently expressed the belief that the purpose of the teams is to make operators *feel* like they are participating in the company, and to provide information to engineers, the members of the People's Team saw the purpose as helping the company gain a competitive edge, specifically to "reduce cycle time." Thus, they believed that their team's accomplishments were important to the company. It did not seem to occur to them that the purpose of the teams was to make them *feel* like they were participating.

ANALYSIS OF THE DATA

This analysis addresses the three research questions, a) What was the team learning process, b) how did the differential availability of power to individual team members affect the collective team learning outcome, and c) how did organizational structures and policies affect the team learning process? First, I will describe the team learning process and how the differential availability of power to individual team members affected the collective team learning outcome. Next, I will address the question of how organizational structures and policies affected the process.

The Collective Team Learning Process

Collective team learning appeared to require team members to carry out both active and reflective work. Essential to doing the reflective work was the team members' ability to dialogue among themselves. This was enhanced by team members controlling the ways in which differences in the power available to individual team members affected their ability to contribute what they knew. Essential to doing the active work was team members' ability to carry out team tasks and interact with individuals beyond the teams' boundaries. Team members' ability to successfully carry out this active work was predicated on the degree of control they had over their own time, movement, and work.

The Reflective Work

Team members carried out the reflective work of team learning within the team's boundaries. This work consisted of the tasks of problem-posing, sharing knowledge and information, and integrating the shared knowledge. To carry out these tasks, team members needed to be able to contribute their ideas without fear of intimidation, embarrassment, or belittlement. The major inhibitor to contributing ideas was the presence of significant differences in the power available to individual team members. In this organization, a hierarchical authority structure along with supporting policies institutionalized these differences. For example, the Lost Team described having difficulties defining a problem. Dave complained that it was "hard to get the right project. One with visible contribution and reasonable amount of work...Our area doesn't have a local problem. All problems are 'fab' wide." Nevertheless, technicians and operators on the team described themselves as reticent to identify problems, because they were afraid their superiors would then associate them with the problem. They were also worried that the auditors who were on the team would expect the workers to have fixed the problems on their own by the next audit.

The tasks of sharing and integrating knowledge were also constrained by the differences in power available to individual members, and these were kept in place by the authority structure. The first requirement essential to either sharing or integrating knowledge in team meetings was attendance. This presented a major obstacle for operators whose "work is to run lots, not experiments. The team takes away from main job. There's a conflict of responsibilities." Operators were often unable to attend team meetings because their supervisors wanted them to remain at their work place. Another constraint was that since operators work shifts, for some of them, the team meetings were held outside of their work hours. Thus, as one operator explained, "When someone doesn't do what they're asked, or doesn't show up, sometimes they're just tired, and so go home. The meeting is at 7:15 am. The night shift has to stay for the team meeting." Managers and engineers did not face these limitations since they had more autonomy and control over how they apportioned their time.

One of the strongest themes to emerge from the comments of team members, regardless of their position in the company, was that low-power members' contributions during meetings were often constrained. Unless differences in available power were controlled or simply did not exist, low-power team members described the climate at the team meetings as "stifling," "intimidating," and "damaging." Team members described behaviors such as treating members differently if an action item was not completed, and public ridicule, as having taught them to sit quietly during team meetings.

The Active Work

The active work of team learning included the tasks of gathering data from outside team boundaries, and disseminating new team knowledge to the organization. In order to carry out these tasks, team members needed to control their own time, movement, and work so that they could gather data, and interact with employees and work areas beyond their own. For operators, time, movement, and work were controlled by their supervisors. They were hourly workers who carried out a specific task, at a specific time, in a specific place. In fact, although the company encouraged and supported teams officially, in fact, the support of the operators' supervisors was needed before they could gather data. Supervisors were apparently rewarded for placing production output before improvement of the manufacturing process. Thus, this conflict in organizational priorities often meant that although operators were encouraged to join teams, their supervisors constrained their participation by not allowing them to carry out their data collection tasks.

Dissemination of new knowledge was also difficult for operators and technicians, since they had little ability to cross boundaries within the organization. As one technician noted, "There's no communication between shifts. I've tried to get to know people on other shifts, but it has been almost impossible." This also limited their understanding of the work their organization did, where their own work fit into the larger organization, how systems within the company operated, and how to get things done so that they could assess the practicality of their projects, and develop strategies for disseminating their new knowledge. Although their low-power position limited them, operators spoke repeatedly about how being on the teams had given them a broader picture of their work and the organization. This was true for operators on all four teams, not just the successful teams. As one operator put it, "Now that I've been on the team for awhile, I'm wondering what's coming in from other areas. Now I'm more involved in the process. I know what it's for."

Team Learning In The Technical And Social Domains

Team learning output affected both the technical and the social systems of the organization. However, most of the team learning evidenced occurred in the technical domain. The "A" Team, the Empowered Team, and the People's team all gave evidence of having produced knowledge within the technical domain. However, there were three incidents of collective team learning that occurred within the social domain, two on the People's Team, and one on the "A" Team. It is important to note, that on both teams, those who participated in the learning process were team members of the same hierarchical level.

First of all, the People's Team became frustrated by the lack of regular attendance at team meetings, and the spotty collection and reporting of data collected between meetings. Since the experiments that yielded the data were part of a larger team inquiry, team members' absence frustrated the team learning process. Out of this frustration,

Chris finally asked the team what they could do to solve the problem. Chris described, "We wound up dividing members into the areas they work in. They each elect their own leader. Then action items can go to the groups, not to individuals. The groups delegate and someone from each group comes to the meeting prepared. We brainstormed this idea." Thus, the People's Team moved beyond the technical domain of learning to produce new knowledge in the social domain. Because their technical learning was frustrated by organizational socio-cultural structures that constrained their attendance at meetings and their ability to collect data, they focused their attention on developing new structures that would enable them to continue their technical learning. By creating area sub-teams, operators as members of groups exercised the power to attend meetings and run experiments, a power they were unable to achieve as individuals. At the same time they found a way to meet their responsibilities to carry out the work assigned to them by their supervisors.

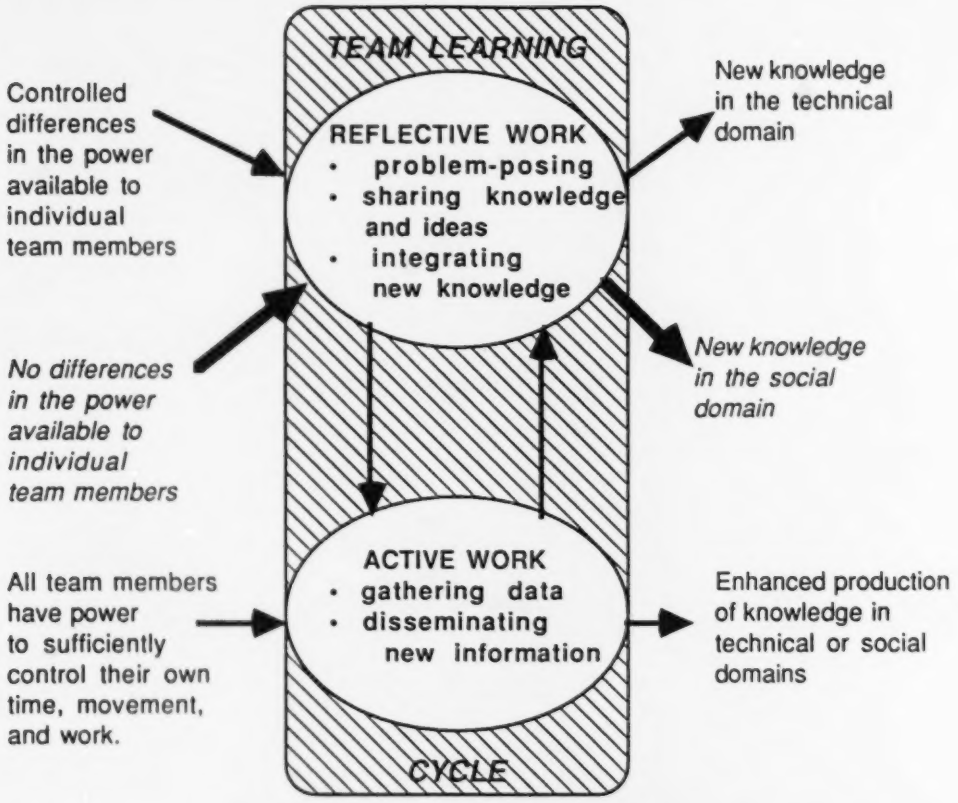
A second incident of team learning in the social domain also took place on the People's Team. Having a limited ability to cross organizational boundaries in order to disseminate their knowledge, the People's Team developed a team newspaper in which they not only disseminated their new technical knowledge, but also their team ideology which seemed to embody at its heart an ethic of mutual respect.

On the "A" Team, team members inspired by a new management style and discouraged by what one of them termed "poor personal interactions," structured their team learning so that "each project has a strong champion. The champion has the expertise to lead the project so they lead the team then. Many different members rise to take leadership. Leadership is allowed to change hands." Barry the leader was described as facilitating this process by not being heavy-handed, being patient, being easy-going, being tolerant, and actually allowing the leadership to change hands. It is important to note however, that this norm of "changing leadership" did not typically include those who were not engineers. This was likely because the power to claim leadership was accrued on this team through technical expertise. Not only did operators and technicians not lead this team, they participated very little in the learning process.

All three of these incidents of learning went beyond collective team learning in the technical domain to team learning in the social domain which generated new possibilities for social structuring within the organization. Both of these incidents also seemed to reflect the teams' attempt to overcome barriers to the active work of the team learning process. It is worth noting a few unique characteristics of these teams. First, all members engaged in the team learning process including the leaders were at roughly the same hierarchical level. Second, in contrast to Hal who also encouraged participation, both Chris and Barry seemed to truly believe that each team member included in the learning process had something important to contribute. Third, both leaders believed the purpose of the teams was to contribute to the company, not to make employees feel as though they were participating. Thus, although it appears that learning can occur in the technical domain when the authority structure is controlled as in the case of the Empowered Team, for it to occur in the social domain there must be no significant hierarchical differences between team members, including the team leader.

Figure 1 provides a simple model to illustrate the relationship of available power to team learning output in the study.

FIGURE 1. The Team Learning Process


TEAM LEARNING
Controlled differences in the power available to individual team members
No differences in the power available to individual team members
All team members have power to sufficiently control their own time, movement, and work.
REFLECTIVE WORK
• problem-posing
• sharing knowledge and ideas
• integrating new knowledge
ACTIVE WORK
• gathering data
• disseminating new information
New knowledge in the technical domain
New knowledge in the social domain
Enhanced production of knowledge in technical or social domains
CYCLE

Organizational Authority Structure And The Distribution Of Power

Within the company employees perceived and interacted with each other according to where they were placed within the company's authority structure. Authority was accrued first by formal position, and second through technical knowledge, so that managers and engineers stood above technicians and operators. Employees seemed to interact with each other in ways that were consonant with the way power was distributed by the authority structure. Thus, employees' positions in the authority structure determined whether or not their problems got addressed, their knowledge was solicited or given attention, their attempts at meaning-making were taken seriously, and whether or not they had any control over the team learning process. Such statements as the following coming from members of all of the teams and from operators, technicians, and supervisors depict an environment in which power based on authority is used to control the process of producing knowledge.

- "I've seen engineer leaders brush operators' problems aside."
- "The fact that operators don't talk is management's' fault. They let engineers run the show."
- "Operators are told not to be on the team because they're needed on-line."
- "On some teams its more stifling. There's the attitude that 'your opinion is not as good as mine.'"
- "On the other teams, managers and engineers would get on a roll. Then it was all over."
- "Women are not on the team. If they are, they keep quiet rather than be identified with problems."
- "There's different treatment depending on the person, if the action item is not complete. These things build in reluctance on the teams."

It is important to note that members of the Empowered Team and the Peoples Team made these statements in regard to teams they had been members of previously, rather than currently. Thus, the power differences that seemed to constrain participation on most of the other teams were not doing so on these two teams. The following discussion of the collective team learning process explains how constraints on participation interfered with tasks that were an essential part of the team learning process.

DISCUSSION AND RESEARCH IMPLICATIONS

This study explored the process of team learning and identified ways in which the organizational context of four teams interacted with this process. An analysis and comparison of the four teams provided several potential insights into the collective team learning process:

- Collective team learning appears to encompass a process of alternating between reflective and active work, which each of which require team members to enact specific learning tasks.
- These tasks include as part of the reflective work problem-posing, sharing knowledge, combining and recombining knowledge, and as part of the active work gathering data from outside team boundaries, and disseminating new team knowledge to the organization.
- However, the organization's authority structure and supporting policies made it difficult for team members to carry out either the reflective or the active work of team learning by structuring an unequal availability of power to team members, and a minimum of control by team members with little access to power over their own time, movement, and work.
- Collective team learning occurred only when the differences in available power were either controlled or not present.
- Thus, according to the data from this study, the differences in available power to employees is a critical lever affecting the output of knowledge by teams.
- The ways in which power is made available to employees affects who may contribute to the production of knowledge and whose contribution others take seriously. It also affects who has the power to control their own time, movement, and work, thus affecting who can enabling the gather data and the distribute new knowledge.

Grounded Propositions

While the generalizability of this research is limited by the fact that I have addressed only four teams in the same corporation, the data have generated four grounded propositions regarding collective team learning in work organizations. However, I intend that these propositions not be taken as an hypothesis of a universal law of team learning, but rather as a heuristic device to enable scholars and practitioners to view teams from a potentially unfamiliar perspective. The following four propositions are grounded in the data I gathered about the four teams:

1) The production of new knowledge requires team members to do both reflective and active work.
2) Members with little available power have difficulty carrying out either the reflective or the active work of producing new knowledge.
3) The production of knowledge in the technical domain occurs only when differences in available power to team members are controlled.
4) The production of knowledge in the social domain occurs only when no differences in available power exist.

Discussion

Knowledge And Power

This study suggests that differences in the availability of power to individual employees constrain the production of knowledge. Although employee power has long been recognized in practice as being important to employee commitment, productivity, and production of high quality goods and services, there has been no attempt to link it with the more recently recognized competitive need for companies to produce new knowledge.

Although there is little in the literature on human resource development about the link between power and the production of knowledge, it has been explored by philosophers (Habermas, 1973; Foucault, 1980), educators (Freire, 1972; Apple, 1982; Giroux, 1988), feminists (Smith, 1975; Lather, 1991; Minnich, 1991), and ethnic and race scholars (Ogbu, 1982; hooks, 1989) among others. The argument put forth by many of these writers is that existing power relations are imbedded in our institutions and that these institutions perpetuate themselves. Those who can claim sufficient power to participate in the ongoing production of knowledge, unwittingly or not, usually reproduce knowledge which supports the existing distribution of power. Lazega (1992) helps explain this by pointing out that part of formal power usually includes a formal authority to know, and the right and duty to define the situation for others (p.68). This formal power enables the furthering of one's own interests.

This literature speaks primarily from a moral vantage point, arguing that justice in a democratic society is not served by excluding particular groups from participating in knowledge production. However, a different argument, and the one made in this article, is that work organizations are seriously disadvantaged by relying predominantly on the limited knowledge and information of high-power individuals. A more diverse and broad-based knowledge and information-base is needed to ground decisions, planning, and such things as new products and service development. Employees from all levels and functions within the organization must be able to contribute their unique knowledge about the work of the organization.

If the unequal availability of power inhibits broad-based participation in the production of knowledge, then it is to these differences that we must address ourselves if we are to maximize our ability to produce new knowledge. Although this argument may seem to point to the need for a flat and non-hierarchical organization, the actions of the

teams in this study suggest that there are many alternatives for controlling or eliminating differences in the power available. For example, two of the successful teams were constructed to include only members at the same hierarchical level in the process of producing knowledge. This left the organization's hierarchy intact while establishing an environment for knowledge production that did not reproduce this hierarchy. However, it is also important to remember that in the case of the Peoples Team, even though knowledge was produced in both the technical and the social domains, the major barriers the team had to address grew out of their lack of power to control their own time, movement and work, and their inability to move easily across organizational boundaries. Without ongoing and focused intervention to alleviate these problems, members with little power available to them had difficulty breaking free from their jobs to gather data, attend team meetings, and distribute new knowledge back to the organization. The lack of power to move outside of team boundaries was not resolved by controlling power differences within team boundaries.

The fact that organizations have tried a succession of change initiatives directed at altering power differences within organizations suggests that although such changes are sought, they are not easily implemented. Such initiatives have included attempts to institute work place democracy, employee empowerment, self-directed work teams, total quality improvement, and flatter organizational hierarchies.
Similarly, the tendency of top management to endorse such initiatives, while at the same time failing to support them on a daily basis, and to retain authority, while at the same time redistributing responsibility downward (Lewis, 1993; Dickens, 1993), suggests that organizational structures and patterns of interaction have deeper roots than most change programs can easily alter. These structures and patterns appear to be historically and culturally situated. Since both history and culture are collective constructions and have for the most part become a taken-for-granted part of our daily reality, they are difficult to identify and resistant to change.

An Historical And Cultural Perspective

From an historical perspective, although such innovations as the attempt at team learning may indicate transition to an era in which the dominant metaphors are those of change and uncertainty rather than those of rational order and predictability, much of life in today's institutions is still imbued with the ideal of technical rationality. This ideal is expressed in how we enact learning and share knowledge. In work organizations, scientific knowledge is applied to the solving of problems by professional experts such as engineers and managers. A professional education acquired at a university in which scientists and scholars create basic knowledge seems to uniquely qualify managers and engineers to address the work and technical problems of high technology manufacturing companies like the one in this study. Engineers and managers bring knowledge to the work setting, and use workers with less knowledge, such as operators and technicians, to enact it. From this perspective, the work of less knowledgeable employees should be routine and require no problem-solving. Furthermore, any learning about improving the practice of the organization should be done by engineers or managers. In a rational hierarchy such as this, scientists create knowledge, engineers and managers solve problems in the application of that knowledge, and semi-skilled and unskilled workers enact the knowledge. This hierarchy effectively concentrates learning in the hands of scientists and professional practitioners, while the learning of workers is tightly controlled and prescribed by those above them. From a perspective that is critical technical rationality, knowledge actually belongs to the community, not high-power individuals, and central to learning is the act of critical self-reflection or attention to and skepticism regarding one's own suppositions.

From a cultural perspective, the cultural ideal for achieving mainstream success in the United States appears to be through competitive individualism (Tocqueville, 1963). This contrasts with other national cultures in which the ideal is to distinguish oneself because of membership in a work group, or to reflect well upon one's family or work group as is more the case in Japan or India (Roland, 1988). The success with team work in work organizations in Japan, for example, is not just an industrial innovation, but is rooted in the Meiji Restoration, in which modern Western institutions were assimilated while retaining "traditional patterns of familial hierarchical relationships with their associated values of emotional interdependence, reciprocal loyalties and obligations, and high levels of performance" (Roland, 1988, p.129). These values reward team work by enhancing personal identity for successful participation in and support of group and team efforts.

In contrast, the United States has a culture rooted in the political, economic, and religious persecution of its immigrants in their native countries before they immigrated to this country. The individual right to do what we want, as long as we do not interfere with the rights of someone else, is enshrined in our national constitution. We frequently view ourselves as self-made, and our success as won in competition with others. According to Bellah and his co-investigators (1985, p.185), the dream of many Americans is "often a very private dream of being a star, the uniquely successful and admirable one, the one who stands out from the crowd of ordinary folk who don't know". Thus, the shift to working in teams in many U.S. work organizations represents not just a structural change in how work is done, but a significant historical and cultural shift affecting the way many individuals identify themselves and attempt to establish their social worth. By identifying and analyzing the difficulties teams encounter in carrying

out their tasks, it is possible to see what specific aspects of our history, society, and culture are in conflict with our intentions to enact change.

Power, Knowledge, And Team Learning In Organizations

The exclusion of low-power employees from the team learning process, although reflective of cultural patterns in the U.S., has serious implications for organizations attempting to transform or adapt in order to better function or compete in a diverse, technologically complex, and quickly changing global environment. Alfred Schutz (1964) writes that knowledge is socially distributed. Following in that same tradition, Berger and Luckmann (1967) write that knowledge of an object is negotiated in the interaction between actors. Building on this theoretical understanding of knowledge, the study reported here suggests that dialogue among team members, as well as between team members and others in the organization, is central to the production of new knowledge. This supports the work of Cicourel (1990), Purser, Pasmore,, and Tenkasi (1992), Dixon (in press) who also name dialogue as central to the production of knowledge.

However, this study goes on to draw on the insights of feminist, race and ethnic, critical, and postmodern scholars to explicitly point at the existence of differences in the amount of power available to team members as a "critical lever" in determining team learning success. Team learning processes which include the unique bodies of knowledge and information distributed among employees throughout the organization are severely inhibited by differences in the power available to individual employees. Team leaders can address these differences and enhance team learning in the technical domain by controlling these power differences in ways similar to what Hal did when he used empowerment ideology. However, in order to enhance team learning in the social domain, differences in power availability must be eliminated. In other words, in order to remake the culture of the organization, differences in power availability must not simply be controlled; they must be eliminated. The presence of differences in the power available to individual employees results in the exclusion rather than the integration of multiple and divergent perspectives, and thus severely limits the learning that is possible by teams in work organizations.

Research implications

In the future, to better understand how differences in power availablility interacts with collective team learning, research should be conducted that examines team learning within different contexts. Although the four teams reported here varied substantially, the organization within which they functioned represented only a small portion of the spectrum of organizations within which learning teams are being utilized. In particular, teams within organizations with different purposes, in different places within their life cycle, and with various configurations of structured authority need to be studied. Teams within large versus small, new versus declining, government versus private, and hierarchical versus flat organizations all need to be examined.

Studies might also be conducted on teams that have as their explicit goal to produce knowledge within the social domain of the organization. Teams which self-reflect on, critique, and develop strategies to change organizational structures and policies should be explored to see what happens when they are explicitly charged with remaking social structures within the organization.

On the whole, with the move toward team-based organizations, coupled with the intention to change unproductive ways of organizing ourselves for work in organizations, more research needs to be done on team learning. In particular, we need to design research that takes into account the ways in which our taken-for-granted patterns of thought and behavior are socio-culturally and historically structured. Collective team learning cannot be understood outside of its socio-cultural and historical context.

CONCLUSION

Based on an analysis of the study reported here, I have identified differences in available power among employees as a critical lever in the successful collective production of knowledge by teams. I have also explored how the context of the particular organization, and the current socio-cultural and historical context in the United States interact to produce the team learning experiences described in this study. Although I hypothesize that the differences in power available to team members may be a critical lever influencing the successful production of knowledge by teams in a variety of organizations, I acknowledge that in similar studies in the future, the way in which this critical lever interacts with the production of knowledge on teams is likely to be influenced by the type of organization, its size, the racial and gender makeup of its members, and its place in an organizational life cycle. The influence of these and other contextual factors will affect the amount of power available to and used by individual employees. They will also affect how power is used in the process of knowledge construction. Similarly, I acknowledge that the interaction will probably be influenced by the composition of individuals on a team, the type of knowledge the team is trying to produce, and the norms and values of the organization.

In the United States, team learning is likely to be profoundly affected by the deep-rooted assumptions about the superiority of competitive individualism as a way of relating to each other and technical rationality as a way of knowing. Even if we personally find these particular qualities of the U.S. national culture at odds with our gender or local culture experiences, the institutions which dominate much of public life are structured so that it is difficult to

live out and express a different cultural pattern. Similarly, many of the institutions in which we work reflect these deeply rooted assumptions about competitive individualism and technical-rationality. Even if we can see the limitations of this world view, and this is often very difficult, we are often stymied in our efforts to envision or create more appropriate ones. The appearance of more and more collective learning teams in work organizations, are an example of our attempt to transcend the limitations of our own history and culture. Although collective team learning is problematic to enact in current organizations, it stands as an important example of our ability to imagine and enact alternative ways of relating and knowing.

REFERENCES

Allen, T.J. (1984). Managing the flow of technology: Technology transfer and the dissemination of technological information within the R & D organization. Cambridge, MA: MIT Press.

Ancona, D.G., & Caldwell, D.F. (1990). Information technology and work groups: The case of new product teams. In J. Galegher, R.E. Kraut, & C. Egido (Eds.), Intellectual teamwork (pp. 173-190). Hillsdale, NJ: Lawrence Erlbaum Associates.

Apple, M. (1982). Cultural and economic reproduction in education. Boston: Routledge.

Austin, A.E., & Baldwin, R.G. (1991). Faculty collaboration: Enhancing the quality of scholarship and teaching. (Ashe-Eric Report No. 7). Washington DC: George Washington University.

Bellah, R., Madsen, R., Sullivan, W., Swidler, A., & Tipton, S. (1985). Habits of the heart. New York: Harper & Row.

Berger, P.L. , & Luckmann, T. (1967). The social construction of reality. London: Allen Lane.

Brooks, A. (1992). Building learning organizations: The individual-culture interaction. Human Resource Development Quarterly, 3(3), 323-335.

Cicourel, A.V. (1987). Cognitive and organizational aspects of medical diagnostic reasoning. Discourse Processes, 10, 347-367.

Cicourel, A.V. (1990). The integration of distributed knowledge in collaborative medical diagnosis. In J. Galegher, R.E. Kraut, & C. Egido (Eds.), Intellectual teamwork (pp. 221-242). Hillsdale, NJ: Lawrence Erlbaum Associates.

Dechant, K., Marsick, V., & Kasl, E. (1993). Toward a model of team learning. Studies in Continuing Education, 15 (1), 1-14.

Denzin, N. (1989). Interpretive interactionism. Newbury Park, CA: Sage Publications.

Dickens, L. (1993). [Action research in a high technology company: A case study]. Unpublished raw data.

Dixon, N. (in press). Organization learning: Becoming intentional. New York: McGraw-Hill.

Freire, P. (1972). Cultural action for freedom. Harmondsworth: Penguin.

Foucault, M. (1980). Power and knowledge: Selected interviews and other writings: 1972-1977. New York: Pantheon.

Foucault, M. (1986). disciplinary power and subjection. In S. Lukes, Power (229-242). New York University Press: New York.

Giroux,, H.A. (1988). Schooling and the struggle for public life: Critical pedagogy in the modern age. Minneapolis: University of Minnesota Press.

Goetz, J.P., & LeCompte, M.D. (1984). Ethnography and qualitative design in educational research. San Diego, CA: Academic Press.

Goodman, P.S. (1986). Impact of task and technology on group performance. In P.S. Goodman (Ed.), Designing effective work groups (pp. 120-167). San Francisco: Jossey-Bass.

Goodman, P.S., Ravlin, E., & Schminke, M. (1990). Understanding groups in organizations. In L.L. Cummings, & B.M. Staw (Eds.), Leadership, participation, and group behavior (pp. 333-385). Greenwich, CT: JAI Press.

Gray, B. (1989). Collaborating: Finding common ground for multiparty problems. San Francisco: Jossey-Bass.

Habermas, J. (1973). Knowledge and human interest. Boston: Beacon Press.

Hackman, R.J. (1987). The design of work teams. In J.W. Lorsch (Ed.), Handbook of organizational behavior (pp. 315-340). Englewood Cliffs, NJ: Prentice-Hall.

hooks, b. (1989). Talking back: Thinking feminist, thinking black. Boston: South End Press.

Kolb, D. (1984). Experiential learning. Englewood Cliffs, NJ: Prentice-Hall.

Kraut, R.E., Egido, C., & Galegher, J. (1990). Patterns of contact and communication in scientific research collaborations. In J. Galegher, R.E., Kraut, & C. Egido (Eds.), Intellectual teamwork (pp. 149-172). Hillsdale, NJ: Lawrence Erlbaum Associates.

Lather, P. (1991). Getting smart: Feminist research and pedagogy with/in the postmodern. New York: Routledge.

BEST COPY AVAILABLE

Lazega, E. (1992). The micropolitics of knowledge. New York: Aldine de Gruyter.

Lincoln, Y.S., & Guba, E.G. (1985). Naturalistic inquiry. Newbury Park, CA: Sage.
McGrath, J.E. (1984). Groups: Interaction and performance. Englewood Cliffs, NJ.: Prentice-Hall.
Minnich, E.K. (1991). Transforming knowledge. Philadelphia: Temple University Press.
Ogbu, J. (1982). Minority education and caste: The American system in cross-cultural perspective. New York: Academic Press.
Parker, G.M. (1990). Team players and teamwork. San Francisco: Jossey- Bass.
Pelz, D.C., & Andrews, F.M. (1966). Scientists in organizations. New York: Wiley.
Purser, R.E., Pasmore, W.A.., & Tenkasi, R.V. (1992). The influence of deliberations on learning in new product development teams. Journal of Engineering and Technology Management, 9 (1), 1-28.
Roland, A. (1988). In search of the self in India and Japan. Princeton, NJ: Princeton University Press.
Schon, D. (1983). The reflective practitioner. New York: Basic Books.
Schutz, A. (1964). Collected Papers II: Studies in social theory. The Hague: Nijhoff.
Schwartzman, H. (1986). Research on work group effectiveness: An anthropological critique. In P.S. Goodman (Ed.), Designing effective work groups, (pp. 237-276). San Francisco: Jossey-Bass.
Smith, D.E. (1975). An analysis of ideological structures and how women are excluded: Consideration for academic women. Canadian Review of Sociology and Anthropology, 12, 353-369.
Tocqueville, A. de (1963). Democracy in America. (G. Lawrence, Trans.). New York: Doubleday, Anchor Books. (Original work published 1836).